

REMARKS/ARGUMENTS

In the office action mailed May 26, 2005, the Examiner asserted the following rejections to the claims:

Claims 1-3 were rejected under 35 USC 102(b) as being anticipated by USP 3,634,683 (the '683 patent) to Bakker;

Claims 1 - 3 were rejected under 35 USC 102(e) as being anticipated by USP 6,791,079 (the '079 patent) to Glukhoy;

Claims 1 - 3 were rejected under 35 USC 103(a) as being unpatentable over USP 4,490,610 (the '610 patent) to Ulbricht;

Claims 1 - 3 and 6 were rejected under 35 USC 103(a) as being unpatentable over USP 6,828,553 (the '553 patent) to Weiss in view of the '610 patent;

Claims 4 - 8¹ and 16 were rejected under 35 USC 103(a) as being unpatentable over the '683 patent;

Claims 17 and 18 were rejected under 35 USC 103(a) as being unpatentable over the '683 patent in view of USP 5,861,623 (the '623 patent) to Park;

Claims 19 - 22 were rejected under 35 USC 103(a) as being unpatentable over the '683 patent in view of the '623 patent.

Claims 9 - 15 were deemed allowable.

The Canceled Claims

Claims 1, 17 and 18 have been canceled in order to expedite allowance of the present application. Applicant reserves the right to resubmit these claims in a continuation application.

¹ It is assumed that there was a typographical error on page 6 of the office action and that the rejection encompasses claims 4-8, not limited to claims 4-5.

The Allowed Subject Matter

Claim 9 has been amended to include the subject matter of claim 1, which has been canceled. Claims 2 through 8 have been amended so that they are now either directly or indirectly dependent on claim 9. Claims 10 through 14 were originally either directly or indirectly dependent on claim 9 and, therefore, have not been amended.

New claims 23 through 29 have been added to the application. These claims incorporate some of the basic subject matter found in allowed claims 9 and 15. It is therefore submitted that these new claims are allowable as well.

Independent Claim 16

As amended, independent claim 16 is directed to a flight tube for use in a time-of-flight mass analyzer. The flight tube employs a plurality of concentric electrodes that are disposed about a linear axis. The plurality of concentric electrodes cooperate with one another to form functional flight tube regions along portions of the flight tube. The first portion is an inlet region that is substantially free of electric fields while the second portion is an ion deflection region having a substantially static electric field where ions received from the inlet region are directed along a generally helical flight path.

None of the references of record either disclose or suggest such a multiple portioned concentric electrode flight tube. Rather, Bakker, the principal reference applied against this claim, merely makes passing reference to the use of two concentric electrodes as a general alternative to the field free linear ion path that is described in detail as its preferred embodiment. (the '683 patent, column 7, lines 7-12). Accordingly, the subject matter of claim 16 is allowable over the art of record.

Independent Claim 19

Claim 19, as originally submitted, is directed to a time-of-flight mass analyzer that includes, among other things, a flight tube having an input region that accepts ions that are generated by an ionizer. The flight tube constrains the ions in a

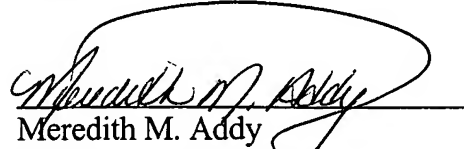
substantially static electric field having non-linear equipotential field lines that circumvent a linear axis. The ions are directed into the input region of the flight tube at an angle that is tangential to the equipotential field lines so that the ions are initially trapped at the input region of the flight tube. An electrode is disposed to generate an electric field that imparts a velocity components along the linear axis so that the ions move away from the input region of the flight tube.

None of the references of record either disclose or suggest a time-of-flight mass analyzer of the type set forth in claim 19. As noted above, Bakker's concentric electrodes "embodiment" is without detail or suggestion as to how it is to be implemented.

Park, the other reference used to reject claim 19, describes a mass analyzer of the type set forth in the background of the present application. Although Park uses delayed extraction of ions, the delayed extraction components and techniques are substantially different than those found in the apparatus of claim 19. In Park, ions are extracted from an area in which the ions have been generated to an area in which the ions flow along an initial linear flight path before being reflected back along a secondary linear flight path. Park does not disclose or suggest that ions may be provided to the input region of a flight tube at a tangential angle with respect to non-linear equipotential field lines in the flight tube so that they are initially trapped in that region. Accordingly, the subject matter of claim 19 is patentable over the art of record.

If for any reason it is believed that a telephone interview would help to resolve any remaining issues, the Examiner is respectfully requested to contact the undersigned attorney.

Respectfully submitted,


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